Munich Cancer Registry

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ICD-10 C91: Lymphoid leukaemia

Incidence and Mortality

Year of diagnosis	1998-2020
Patients	5,427
Diseases	5,433
Creation date	12/21/2021
Database export	12/20/2021
Population	4.95 m

Munich Cancer Registry
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Munich, 81377
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https://www.tumorregister-muenchen.de/en

https://www.tumorregister-muenchen.de/en/facts/base/bC91__E-ICD-10-C91-Lymphoid-leukaemia-incidence-and-mortality.pdf

Index of figures and tables

Global Statements about the statistics on the Internet −
Baseline Statistics (grey button), **Survival** (red button)

In these analyses, the clinics and physicians of Upper Bavaria and the city and county of Landshut[#], with a total of 4.69 million inhabitants, account for the frequency of cancer diseases[##] and the achieved long term results. Additionally, the long term survival evaluated by the Munich Cancer Registry (MCR) is compared with the results of the population-based registry in the USA (SEER), which is useful for checking the consistency of the data on an international level.

In comparing several tables, inconsistent figures may be detected. This is based on the fact that different patient cohorts are included in the base calculation, for example when proportions of multiple tumors or DCO-cases[###] are concerned. In other cases the individual tumor diagnosis is the basis for calculation, for example with incidence.

The foot notes describe the currentness of the data. The baseline statistics and survival data are updated annually. This yearly analysis comprises the Annual Report of the MCR.

Clinics and physicians have access to essentially more detailed data, with which they can check, compare and in the best case optimize their own data and results.

We would be pleased to receive corrections, critique and useful suggestions. Just send an e-mail to tumor@ibe.med.uni-muenchen.de.

Munich Cancer Registry, December 2021

[#] Base data has been collected since 1998. An increase in new diseases is apparent, which is an effect of two extensions in the MCR catchment area (from a base population of 2.65 million to 4.10 in 2002, and to 4.69 million in 2007).

[##] Due to the high frequency and good prognosis of non-malignant skin cancer (C44), no systematic ascertainment is performed for this diagnosis. C44 is not designated as a primary, but rather as a secondary tumor.

[###] DCO (death certificate only) identifies a cancer case that first becomes available to the MCR through the death certificate.

Some remarks regarding this cancer type

The results for leukemias should be interpreted with caution. As with other primarily non-surgically or non-radiologically treated cancer diseases, the MCR hardly manages to obtain even the simplest information on this cancer. The proportion of DCO cases indicates a situation that is far away from a satisfying cooperation. In the group of institutions that potentially participate in reporting are a few hospitals that refuse any contribution to MCR.

ICD-10 codes (ICD-10 2015) used for specifying cancer site

Code	Description
C91.-	Lymphoid leukaemia
C91.0	Acute lymphoblastic leukaemia [ALL]
C91.1	Chronic lymphocytic leukaemia of B-cell type
C91.3	Prolymphocytic leukaemia of B-cell type
C91.4	Hairy-cell leukaemia
C91.5	Adult T-cell lymphoma/leukaemia (HTLV-1-associated)
C91.6	Prolymophocytic leukaemia of T-cell type
C91.7	Other lymphoid leukaemia
C91.8	Mature B-cell leukaemia Burkitt-type
C91.9	Lymphoid leukaemia, unspecified

INCIDENCE

Table 1

Cases by year of diagnosis, proportions of DCO, further malignancies, deaths, and active follow-up (ALL PATIENTS) (incl. DCO)

Year of diagnosis	All cases n	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	153	38	24.8	11.8	17.0	79.1	97.4
1999	137	19	13.9	12.4	17.1	69.3	97.8
2000	138	23	16.7	11.4	17.0	73.2	97.1
2001	183	46	25.1	11.6	16.8	76.0	96.2
2002	298	83	27.9	12.0	16.7	77.2	96.3 #
2003	268	70	26.1	12.1	16.6	72.8	96.6
2004	296	58	19.6	12.8	16.5	67.6	94.6
2005	290	65	22.4	13.6	16.4	69.7	94.5
2006	289	44	15.2	14.5	16.0	69.2	94.5
2007	339	62	18.3	14.8	15.3	64.9	94.4 #
2008	308	58	18.8	15.5	15.5	63.6	100.0
2009	322	53	16.5	15.8	14.7	59.3	97.5
2010	305	61	20.0	16.3	13.9	63.6	98.0
2011	310	58	18.7	17.0	13.8	57.4	98.7
2012	321	59	18.4	17.2	13.2	55.5	97.5
2013	297	56	18.9	17.4	12.2	58.6	96.6
2014	238	58	24.4	17.7	11.4	61.3	95.8
2015	234	53	22.6	18.0	10.6	54.7	97.0
2016	214	54	25.2	18.1	9.4	50.9	98.6
2017	214	73	34.1	18.6	7.9	52.3	97.7
2018	141	22	15.6	18.9	6.9	41.1	97.2
2019	75	3	4.0	19.1	3.9	30.7	97.3
2020	63			19.2	3.2	14.3	100.0 ##
1998-2020	5433	1116	20.5	19.2	17.0	62.6	96.8

5,433 cases diagnosed 1998-2020 are related to a total of 5,427 patients. Currently, in 1,857 (34.2 %) of these 5,427 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 1,329 / 356 / 172 (24.5 % / 6.6 % / 3.2 %) patients exist having 2 / 3 / 4+ malignancies.

The increases of incident cases in 2002 and 2007 reflect the expansion to additional registry areas.

Please be aware that data of recent annual patient cohorts may not yet be fully processed. The years under evaluation can be retreived from the respective headings.

How to interpret:
In 2018, a subgroup of 141 cases has been diagnosed, of which 18.9 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 6.9 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1a

Cases by year of diagnosis, proportions of DCO, further malignancies, deaths, and active follow-up (MALES) (incl. DCO)

Year of diagnosis	Males n	Males %	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	89	58.2	19	21.3	13.5	19.4	76.4	95.5
1999	71	51.8	10	14.1	13.1	19.5	78.9	100.0
2000	84	60.9	13	15.5	11.5	19.4	73.8	96.4
2001	102	55.7	22	21.6	11.8	19.0	77.5	95.1
2002	172	57.7	37	21.5	12.4	18.8	73.8	94.8 #
2003	166	61.9	34	20.5	12.9	18.6	71.1	96.4
2004	179	60.5	30	16.8	13.3	18.3	68.2	93.3
2005	181	62.4	37	20.4	14.1	18.1	69.6	95.6
2006	183	63.3	24	13.1	15.6	17.8	68.9	94.0
2007	193	56.9	21	10.9	15.6	17.2	64.8	93.3 #
2008	182	59.1	27	14.8	16.0	17.1	60.4	100.0
2009	183	56.8	24	13.1	16.4	16.4	57.9	97.8
2010	180	59.0	33	18.3	16.8	15.1	62.8	97.8
2011	180	58.1	27	15.0	17.6	14.7	57.2	99.4
2012	187	58.3	28	15.0	17.8	13.4	52.9	96.8
2013	178	59.9	34	19.1	18.1	12.3	57.9	97.2
2014	152	63.9	27	17.8	18.2	11.8	57.9	96.1
2015	143	61.1	25	17.5	18.7	10.7	51.0	97.2
2016	128	59.8	28	21.9	18.7	8.9	46.9	99.2
2017	129	60.3	41	31.8	19.4	7.3	48.8	98.4
2018	81	57.4	15	18.5	19.9	4.9	48.1	98.8
2019	43	57.3	2	4.7	20.0	3.4	30.2	97.7
2020	49	77.8			20.1	4.2	16.3	100.0 ##
1998-2020	3235	59.5	558	17.2	20.1	19.4	61.4	96.7

3,235 cases diagnosed 1998-2020 are related to a total of 3,231 patients. Currently, in 1,192 (36.9 %) of these 3,231 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 829 / 233 / 130 (25.7 % / 7.2 % / 4.0 %) patients exist having 2 / 3 / 4+ malignancies.

The increases of incident cases in 2002 and 2007 reflect the expansion to additional registry areas.

Please be aware that data of recent annual patient cohorts may not yet be fully processed. The years under evaluation can be retreived from the respective headings.

How to interpret:
In 2018, a subgroup of 81 cases has been diagnosed, of which 19.9 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 4.9 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1b

Cases by year of diagnosis, proportions of DCO, further malignancies, deaths, and active follow-up (FEMALES) (incl. DCO)

Year of diagnosis	Females n	Females %	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %	
1998	64	41.8	19	29.7	9.4	13.6	82.8	100.0	
1999	66	48.2	9	13.6	11.5	13.7	59.1	95.5	
2000	54	39.1	10	18.5	11.4	13.6	72.2	98.1	
2001	81	44.3	24	29.6	11.3	13.6	74.1	97.5	
2002	126	42.3	46	36.5	11.5	13.5	81.7	98.4	#
2003	102	38.1	36	35.3	11.2	13.5	75.5	97.1	
2004	117	39.5	28	23.9	12.1	13.9	66.7	96.6	
2005	109	37.6	28	25.7	12.8	13.8	69.7	92.7	
2006	106	36.7	20	18.9	13.0	13.4	69.8	95.3	
2007	146	43.1	41	28.1	13.7	12.5	65.1	95.9	#
2008	126	40.9	31	24.6	14.7	13.0	68.3	100.0	
2009	139	43.2	29	20.9	15.0	12.2	61.2	97.1	
2010	125	41.0	28	22.4	15.5	12.2	64.8	98.4	
2011	130	41.9	31	23.8	16.1	12.4	57.7	97.7	
2012	134	41.7	31	23.1	16.3	12.8	59.0	98.5	
2013	119	40.1	22	18.5	16.5	11.9	59.7	95.8	
2014	86	36.1	31	36.0	16.9	10.7	67.4	95.3	
2015	91	38.9	28	30.8	17.1	10.4	60.4	96.7	
2016	86	40.2	26	30.2	17.3	10.1	57.0	97.7	
2017	85	39.7	32	37.6	17.5	8.8	57.6	96.5	
2018	60	42.6	7	11.7	17.6	10.1	31.7	95.0	
2019	32	42.7	1	3.1	17.8	4.8	31.3	96.9	
2020	14	22.2			17.9	0.0	7.1	100.0	##
1998-2020	2198	40.5	558	25.4	17.9	13.6	64.2	97.0	

2,198 cases diagnosed 1998-2020 are related to a total of 2,196 patients. Currently, in 665 (30.3 %) of these 2,196 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 500 / 123 / 42 (22.8 % / 5.6 % / 1.9 %) patients exist having 2 / 3 / 4+ malignancies.

\# The increases of incident cases in 2002 and 2007 reflect the expansion to additional registry areas.

Please be aware that data of recent annual patient cohorts may not yet be fully processed. The years under evaluation can be retreived from the respective headings.

How to interpret:
In 2018, a subgroup of 60 cases has been diagnosed, of which 17.6 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 10.1 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 2

Incidence measures by year of diagnosis including DCO cases
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.94 m as of 2007, respectively)

Year of diagnosis	Males n	Females n	Males Inc. raw	Fem. Inc. raw	Males Inc. WS	Fem. Inc. WS	Males Inc. ES	Fem. Inc. ES	Males Inc. BRD-S	Fem. Inc. BRD-S
1998	89	64	8.0	5.4	5.8	2.9	7.6	3.8	9.2	4.6
1999	71	66	6.3	5.6	4.6	4.4	6.0	4.8	7.3	5.0
2000	84	54	7.4	4.5	5.5	2.9	7.0	3.4	8.0	3.8
2001	102	81	8.8	6.7	6.6	4.1	8.4	4.9	9.7	5.5
2002	172	126	9.2	6.4	6.4	3.1	8.2	4.2	9.8	5.2
2003	166	102	8.9	5.2	6.1	3.1	7.8	3.7	9.5	4.3
2004	179	117	9.5	5.9	6.7	3.5	8.3	4.3	9.9	4.9
2005	181	109	9.6	5.5	6.7	3.3	8.3	3.9	10.1	4.7
2006	183	106	9.6	5.3	6.8	3.2	8.3	3.7	9.8	4.3
2007	193	146	8.7	6.3	5.4	4.0	7.2	4.6	8.9	5.2
2008	182	126	8.2	5.4	5.8	3.2	6.9	3.8	8.0	4.3
2009	183	139	8.2	6.0	4.7	3.4	6.5	4.1	7.9	4.7
2010	180	125	8.0	5.3	5.1	3.0	6.4	3.6	7.9	4.1
2011	180	130	8.0	5.6	5.4	3.3	6.5	3.8	7.6	4.2
2012	187	134	8.2	5.7	5.5	3.9	6.5	4.2	7.9	4.6
2013	178	119	7.7	5.0	4.8	3.0	6.0	3.5	7.3	4.1
2014	152	86	6.5	3.6	3.7	1.4	5.0	2.0	6.0	2.6
2015	143	91	6.0	3.7	3.0	1.7	4.3	2.3	5.5	2.8
2016	128	86	5.3	3.5	2.6	1.3	3.8	1.9	4.9	2.5
2017	129	85	5.3	3.4	2.4	1.2	3.6	1.8	4.7	2.3
2018	81	60	3.3	2.4	1.7	1.1	2.4	1.6	3.0	1.9
2019	43	32	1.8	1.3	0.9	0.7	1.3	0.9	1.6	1.1
2020	49	14	2.0	0.6	1.1	0.3	1.4	0.4	1.8	0.4
1998-2020	3235	2198	7.0	4.6	4.4	2.6	5.6	3.1	6.8	3.6

The computation of the incidence measures includes all cancers, irrespective of first or subsequent malignancy.

Table 3

Age distribution parameters by year of diagnosis (ALL PATIENTS)
(incl. DCO)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	153	64.4	20.4	1.4	95.8	39.8	57.7	67.1	77.9	85.2
1999	137	59.1	23.4	0.3	104	6.3	54.2	63.5	74.9	80.5
2000	138	62.1	20.7	2.1	91.2	38.5	55.7	65.3	74.9	85.1
2001	183	62.8	22.1	1.4	94.0	34.3	56.2	67.0	76.3	87.3
2002	298	65.7	20.3	2.6	95.0	37.0	60.5	68.7	78.9	87.9
2003	268	64.2	22.4	0.3	98.9	29.5	57.5	68.9	78.9	85.6
2004	296	62.5	21.9	1.4	98.6	29.0	55.7	66.7	77.3	84.5
2005	290	63.2	23.7	0.6	97.1	20.4	57.6	69.9	78.0	85.1
2006	289	63.9	22.9	1.3	95.4	19.3	58.5	69.3	78.3	85.6
2007	339	64.6	21.9	0.3	99.8	35.5	57.4	69.1	80.1	86.1
2008	308	63.7	24.0	0.4	97.4	13.9	60.5	69.9	79.2	86.2
2009	322	66.1	20.0	1.3	98.6	43.2	58.0	70.2	79.9	86.5
2010	305	65.8	23.4	0.3	101	31.8	56.7	72.1	81.5	88.4
2011	310	64.1	23.8	2.5	101	14.4	56.6	70.8	80.0	87.5
2012	321	62.6	25.4	0.6	102	14.9	55.0	71.1	80.5	87.0
2013	297	64.6	22.8	0.1	100	25.0	57.0	70.8	78.9	87.3
2014	238	68.7	19.5	2.7	98.3	43.3	60.9	72.7	81.4	90.0
2015	234	69.6	17.3	4.9	96.6	49.0	62.9	73.7	80.0	87.7
2016	214	70.6	16.3	17.5	97.5	48.3	63.5	75.0	81.0	88.1
2017	214	73.0	14.8	16.8	97.4	51.6	65.5	75.5	83.8	88.9
2018	141	67.7	16.6	8.3	95.6	44.3	57.7	71.6	79.4	85.8
2019	75	66.3	17.0	20.2	98.8	47.7	54.7	65.8	79.3	86.1
2020	63	65.6	17.7	18.5	93.9	35.7	56.4	68.8	80.7	83.5
1998-2020	5433	65.2	21.7	0.1	104	34.9	58.0	70.2	79.5	86.7

Table 3a

Age distribution parameters by year of diagnosis (MALES)
(incl. DCO)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	89	61.6	21.1	2.0	95.8	37.1	54.9	64.6	74.9	83.8
1999	71	60.5	21.7	0.3	89.4	31.9	54.2	63.1	77.0	82.6
2000	84	61.1	19.2	2.6	91.1	43.8	55.3	64.5	71.6	80.2
2001	102	59.7	20.3	1.4	90.7	36.8	52.3	64.5	72.4	79.2
2002	172	62.0	20.9	2.6	90.9	31.1	55.7	66.3	75.5	82.5
2003	166	62.4	21.2	1.6	90.7	29.5	56.3	67.1	76.1	83.1
2004	179	60.7	21.8	1.4	95.2	25.6	55.4	64.7	75.0	81.9
2005	181	62.1	23.4	0.7	94.6	20.3	56.5	68.7	77.2	82.7
2006	183	62.4	23.0	1.3	95.4	19.3	57.0	68.2	77.5	84.1
2007	193	64.4	19.3	0.3	97.8	41.1	57.0	68.7	77.2	83.3
2008	182	61.7	24.3	0.4	93.7	11.8	60.0	69.4	77.0	83.0
2009	183	66.3	17.4	2.2	97.0	48.2	58.0	69.7	77.5	84.4
2010	180	64.4	22.9	0.3	101	31.7	53.9	71.1	80.4	86.8
2011	180	62.4	22.8	2.5	101	17.5	54.6	68.7	77.7	84.4
2012	187	62.7	24.6	2.4	95.2	14.9	57.4	71.0	79.6	84.7
2013	178	64.0	22.4	2.3	100	24.2	54.3	70.7	78.3	87.2
2014	152	66.0	19.4	3.7	95.9	42.4	57.8	70.2	78.5	85.4
2015	143	69.0	16.8	4.9	96.6	51.5	62.3	73.4	79.6	85.2
2016	128	68.6	16.3	17.5	97.5	47.9	60.1	73.4	79.2	86.8
2017	129	71.1	15.4	16.8	93.8	48.1	63.3	74.2	82.9	88.4
2018	81	67.6	17.7	8.3	92.1	44.1	59.3	72.8	79.8	85.8
2019	43	68.1	15.7	20.2	97.6	50.9	57.6	71.4	79.9	86.1
2020	49	65.7	17.5	18.5	93.9	35.6	56.4	69.3	80.6	83.5
1998-2020	3235	63.9	21.0	0.3	101	34.9	56.8	69.0	77.7	84.5

Table 3b

Age distribution parameters by year of diagnosis (FEMALES)
(incl. DCO)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	64	68.3	18.8	1.4	93.9	45.2	61.6	73.7	79.2	86.7
1999	66	57.6	25.1	1.5	104	4.1	53.2	63.6	74.0	78.2
2000	54	63.6	23.0	2.1	91.2	38.5	58.2	68.2	77.4	86.5
2001	81	66.6	23.7	2.8	94.0	34.3	61.5	72.0	82.6	90.4
2002	126	70.8	18.3	2.9	95.0	49.5	63.9	74.1	83.5	90.1
2003	102	67.3	24.2	0.3	98.9	47.3	59.4	73.6	81.7	90.6
2004	117	65.3	21.7	4.3	98.6	35.3	58.1	69.4	80.2	87.3
2005	109	65.1	24.2	0.6	97.1	20.8	62.3	73.9	79.6	88.8
2006	106	66.6	22.6	2.5	93.9	32.7	61.2	72.7	81.3	86.6
2007	146	64.8	25.0	1.0	99.8	13.3	59.0	70.9	82.5	87.6
2008	126	66.7	23.4	1.4	97.4	22.0	60.9	71.6	82.6	88.3
2009	139	65.8	23.1	1.3	98.6	28.2	57.5	71.2	82.9	87.6
2010	125	67.7	24.1	0.8	97.5	32.6	61.2	74.7	84.2	89.5
2011	130	66.4	25.0	2.5	96.7	13.3	58.2	73.3	83.5	89.6
2012	134	62.4	26.7	0.6	102	12.6	51.1	71.3	82.8	88.7
2013	119	65.4	23.4	0.1	97.9	27.3	59.5	70.8	81.5	90.4
2014	86	73.4	18.8	2.7	98.3	47.1	68.5	77.7	84.7	91.6
2015	91	70.4	18.1	5.0	95.9	43.1	64.3	73.9	82.7	89.5
2016	86	73.4	16.0	28.4	96.0	51.1	67.6	76.3	85.1	89.2
2017	85	75.8	13.2	41.3	97.4	55.9	67.8	77.6	86.1	90.7
2018	60	67.7	15.3	32.9	95.6	45.7	57.1	70.7	79.4	85.5
2019	32	63.9	18.7	21.2	98.8	44.3	51.5	64.9	78.9	82.2
2020	14	65.1	19.1	25.6	86.5	35.7	58.7	67.6	81.7	85.8
1998-2020	2198	67.0	22.4	0.1	104	34.9	60.3	72.6	82.1	88.9

Table 4

Age distribution by 5-year age group and sex for period 2007-2020 (incl. DCO)

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	92	2.7	2.7	54	2.7	2.7	38	2.8	2.8
5-9	62	1.8	4.6	32	1.6	4.3	30	2.2	5.0
10-14	39	1.2	5.7	22	1.1	5.4	17	1.2	6.2
15-19	41	1.2	6.9	26	1.3	6.7	15	1.1	7.3
20-24	27	0.8	7.7	17	0.8	7.5	10	0.7	8.0
25-29	27	0.8	8.5	14	0.7	8.2	13	0.9	9.0
30-34	36	1.1	9.6	19	0.9	9.2	17	1.2	10.2
35-39	41	1.2	10.8	25	1.2	10.4	16	1.2	11.4
40-44	71	2.1	12.9	36	1.8	12.2	35	2.5	13.9
45-49	107	3.2	16.1	79	3.9	16.1	28	2.0	16.0
50-54	147	4.3	20.4	104	5.2	21.3	43	3.1	19.1
55-59	209	6.2	26.6	132	6.6	27.9	77	5.6	24.7
60-64	253	7.5	34.1	151	7.5	35.4	102	7.4	32.1
65-69	392	11.6	45.7	251	12.5	47.9	141	10.3	42.4
70-74	486	14.4	60.0	310	15.4	63.3	176	12.8	55.2
75-79	459	13.6	73.6	292	14.5	77.9	167	12.2	67.4
80-84	405	12.0	85.6	238	11.9	89.7	167	12.2	79.5
85+	487	14.4	100.0	206	10.3	100.0	281	20.5	100.0
All ages	3381	100.0		2008	100.0		1373	100.0	

Table 5

Age-specific incidence, DCO rate and proportion of all cancers
for period 2007–2020

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males DCO rate n=332 %	Females DCO rate n=337 %	Males Prop.all cancers n=153686 %	Females Prop.all cancers n=155051 %
0- 4	54	38	3.3	2.5		2.6	24.5	22.2
5- 9	32	30	2.1	2.0	3.1		27.4	30.0
10-14	22	17	1.4	1.1			16.1	13.3
15-19	26	15	1.5	0.9		6.7	8.2	5.7
20-24	17	10	0.8	0.5		10.0	2.7	1.9
25-29	14	13	0.6	0.6		7.7	1.5	1.1
30-34	19	17	0.8	0.7	5.3	5.9	1.5	0.8
35-39	25	16	1.1	0.7		6.3	1.4	0.5
40-44	36	35	1.4	1.4			1.3	0.6
45-49	79	28	2.9	1.1			1.6	0.3
50-54	104	43	4.1	1.7	3.8	4.7	1.2	0.3
55-59	132	77	6.2	3.5	4.5	1.3	1.0	0.6
60-64	151	102	8.5	5.4	5.3	5.9	0.9	0.7
65-69	251	141	15.4	7.8	8.0	7.8	1.0	0.7
70-74	310	176	20.7	10.2	10.0	10.2	1.1	0.9
75-79	291	167	24.0	11.1	16.8	22.8	1.2	0.9
80-84	238	166	32.9	15.6	29.4	41.0	1.5	1.1
85+	206	281	44.1	27.0	68.9	66.5	2.0	1.7
All ages	2007	1372			16.5	24.6	1.3	0.9
Incidence								
Raw			6.2	4.1				
WS			3.7	2.2				
ES			4.7	2.7				
BRD-S			5.8	3.1				

The age-specific incidence characterizes the disease risk in a particular age group. The age distribution depends on the patient population frequency in each age group and reflects the tangible clinical picture of everyday patients care (see following chart).

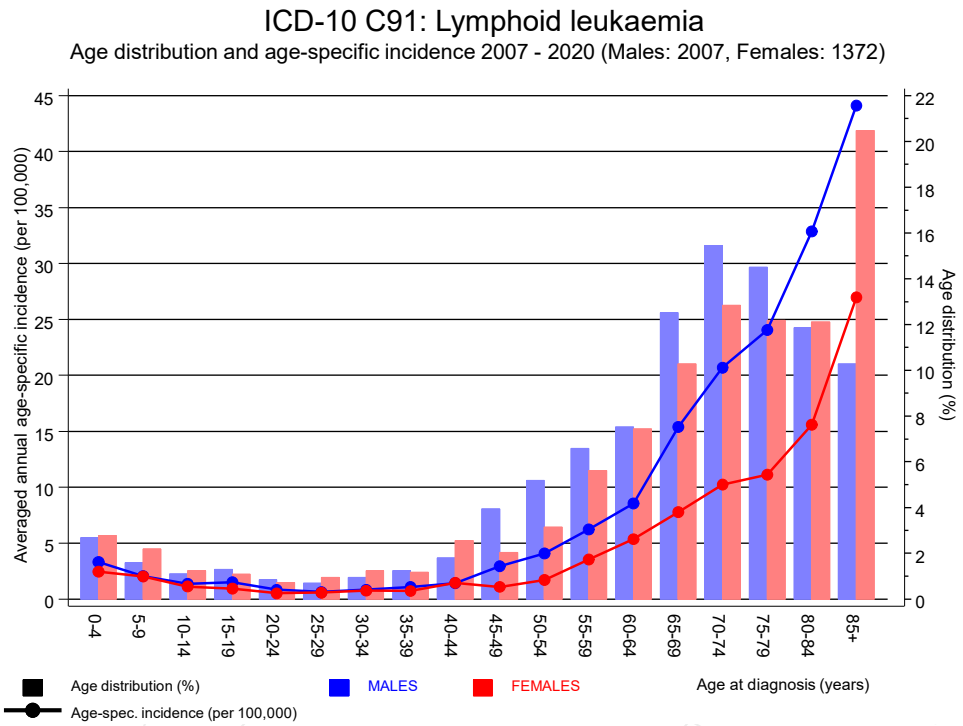


Figure 6. Age distribution (males: mean=65.3 yrs, median=70.6 yrs; females: mean=67.5 yrs, median=73.3 yrs) and age-specific incidence.

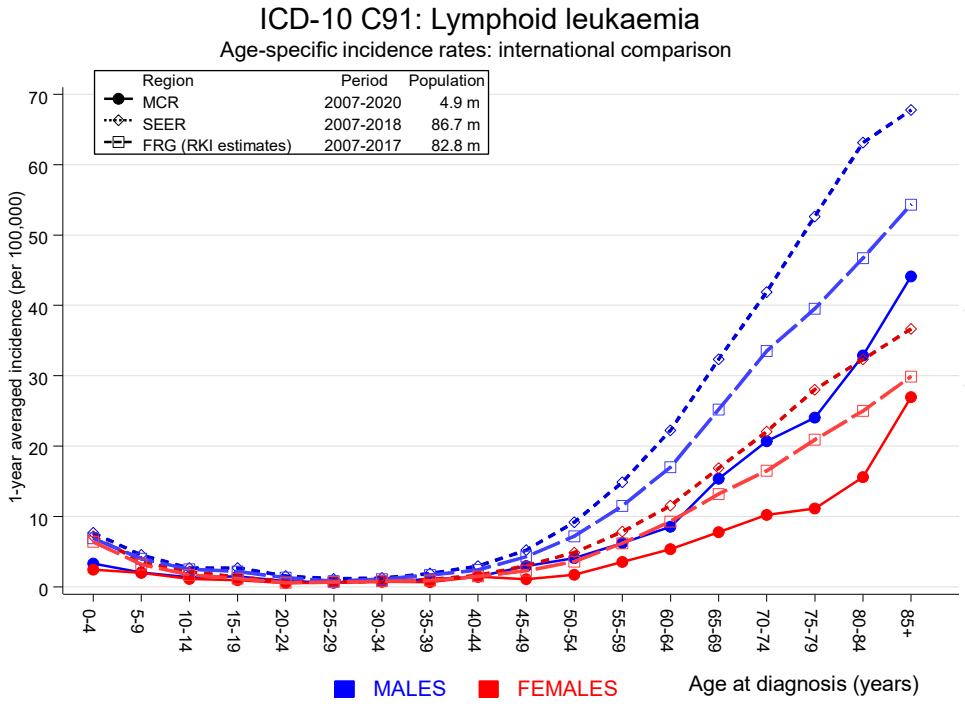


Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, RKI estimates) and SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

Estimated age-specific patient population of Germany, latest update: 16 March 2021. German Centre for Cancer Registry Data, Robert Koch Institute (RKI), based on data of the population based cancer registries. http://www.krebsdaten.de. Last access: 08/17/2021
Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 21 Regs Research Data, released April 2021, based on the November 2020 submission. http://www.seer.cancer.gov.

Table 7a

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of further malignancies for period 1998–2020
MALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C00	Lip	3	0.2	13.3	2.7	38.8	#	2.1	
C03–C06	Oral cavity	3	1.6	1.9	0.4	5.4		1.0	
C07–C08	Salivary gland	7	0.5	14.3	5.7	29.4	#	4.9	
C09–C10	Oropharynx	4	2.0	2.0	0.6	5.2		1.5	
C12–C13	Hypopharynx	2	1.1	1.9	0.2	6.7		0.7	
C15	Oesophagus	8	4.0	2.0	0.9	4.0		3.0	
C16	Stomach	19	8.0	2.4	1.4	3.7	#	8.3	
C17	Small intestine	4	1.2	3.3	0.9	8.4		2.1	
C18	Colon	39	19.7	2.0	1.4	2.7	#	14.4	2.6
C19–C20	Rectum	28	10.7	2.6	1.7	3.8	#	13.0	
C22	Liver	10	5.9	1.7	0.8	3.1		3.0	10.0
C25	Pancreas	15	8.0	1.9	1.0	3.1	#	5.2	
C33–C34	Lung	66	23.8	2.8	2.1	3.5	#	31.6	7.6
C37	Thymus	2	0.1	17.3	2.1	62.4	#	1.4	
C38,C45	Mesothelioma	4	1.4	2.8	0.8	7.1		1.9	25.0
C43	Malign. melanoma	46	9.3	4.9	3.6	6.6	#	27.4	
C44	Skin others	2	0.1	36.2	4.4	130.8	#	1.5	
C46,C49	Soft tissue	5	1.2	4.3	1.4	9.9	#	2.9	
C50	Breast	3	0.6	5.4	1.1	15.8	#	1.8	
C60	Penis	3	0.5	5.8	1.2	17.1	#	1.9	
C61	Prostate	117	57.4	2.0	1.7	2.4	#	44.6	3.4
C62	Testis	3	0.5	5.5	1.1	16.1	#	1.8	
C64	Kidney	16	7.0	2.3	1.3	3.7	#	6.7	
C65	Renal pelvis	3	0.9	3.2	0.7	9.4		1.5	
C67	Bladder	21	9.6	2.2	1.3	3.3	#	8.5	
C70–C72	CNS cancer	13	2.6	5.0	2.7	8.6	#	7.8	7.7
C73	Thyroid	4	1.3	3.2	0.9	8.1		2.1	
C76–C79	CUP	9	3.4	2.6	1.2	5.0	#	4.2	
C81	Hodgkin lymphoma	8	0.5	16.3	7.0	32.1	#	5.6	
C82–C85	NHL	42	8.7	4.8	3.5	6.5	#	24.9	7.1
C90	Mult. myeloma	9	2.7	3.3	1.5	6.3	#	4.7	
C91–C96	Leukaemia	14	3.2	4.4	2.4	7.4	#	8.1	21.4
Others, specified		7	4.3	1.6	0.7	3.4		2.0	
Not observed		0	3.3	0.0	0.0	1.1		−2.5	
All further malignancies		539	205.2	2.6	2.4	2.9	#	249.6	3.5

Patients	2740
Median age at next malignancy (years)	73.4
Person-years	13375
Mean observation time (years)	4.9
Median observation time (years)	3.7

The occurrence of further specified malignancy is statistically significant.

Further observed malignancies with count 1 are pooled in category “Others, specified”.

Table 7b

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of further malignancies for period 1998–2020
FEMALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C00	Lip	1	0.1	16.0	0.4	89.3		1.2	
C03–C06	Oral cavity	2	0.5	4.2	0.5	15.1		1.9	
C07–C08	Salivary gland	2	0.1	14.2	1.7	51.2	#	2.3	
C09–C10	Oropharynx	2	0.3	6.1	0.7	22.1		2.1	
C14	ENT cancer	1	0.0	76.7	1.9	427.2	#	1.2	
C15	Oesophagus	1	0.6	1.8	0.0	10.0		0.5	
C16	Stomach	5	2.9	1.7	0.6	4.0		2.6	
C18	Colon	18	8.4	2.1	1.3	3.4	#	11.8	11.1
C19–C20	Rectum	7	3.4	2.1	0.8	4.3		4.5	14.3
C21	Anus/canal	5	0.5	10.8	3.5	25.2	#	5.6	
C22	Liver	3	1.1	2.8	0.6	8.1		2.4	33.3
C23–C24	Bile	2	1.2	1.6	0.2	5.9		0.9	
C25	Pancreas	13	4.1	3.2	1.7	5.5	#	11.0	7.7
C33–C34	Lung	28	6.4	4.4	2.9	6.3	#	26.6	7.1
C43	Malign. melanoma	13	3.2	4.1	2.2	7.0	#	12.1	
C46,C49	Soft tissue	1	0.5	2.0	0.1	11.3		0.6	
C48	Peritoneal	1	0.4	2.8	0.1	15.6		0.8	
C50	Breast	62	25.1	2.5	1.9	3.2	#	45.6	
C53	Cervix uteri	3	1.0	3.1	0.6	9.0		2.5	
C54	Corpus uteri	12	4.7	2.5	1.3	4.4	#	9.0	
C56	Ovary	8	3.4	2.4	1.0	4.7	#	5.7	
C64	Kidney	8	2.0	3.9	1.7	7.7	#	7.4	
C65	Renal pelvis	1	0.3	3.6	0.1	19.9		0.9	
C67	Bladder	1	1.7	0.6	0.0	3.3		−0.9	
C69	Eye lymphoma	1	0.0	39.7	1.0	221.2	#	1.2	
C70–C72	CNS cancer	3	1.1	2.7	0.6	7.8		2.3	
C73	Thyroid	10	1.2	8.1	3.9	14.8	#	10.8	
C76–C79	CUP	6	1.6	3.8	1.4	8.3	#	5.5	
C81	Hodgkin lymphoma	2	0.2	12.3	1.5	44.5	#	2.3	
C82–C85	NHL	33	3.4	9.7	6.7	13.6	#	36.6	6.1
C90	Mult. myeloma	4	1.1	3.7	1.0	9.5	#	3.6	
C91–C96	Leukaemia	7	1.3	5.4	2.2	11.2	#	7.1	
Not observed		0	3.2	0.0	0.0	1.2		−4.0	
All further malignancies		266	84.9	3.1	2.8	3.5	#	223.7	3.4

Patients	1680
Median age at next malignancy (years)	74.2
Person-years	8096
Mean observation time (years)	4.8
Median observation time (years)	3.2

The occurrence of further specified malignancy is statistically significant.

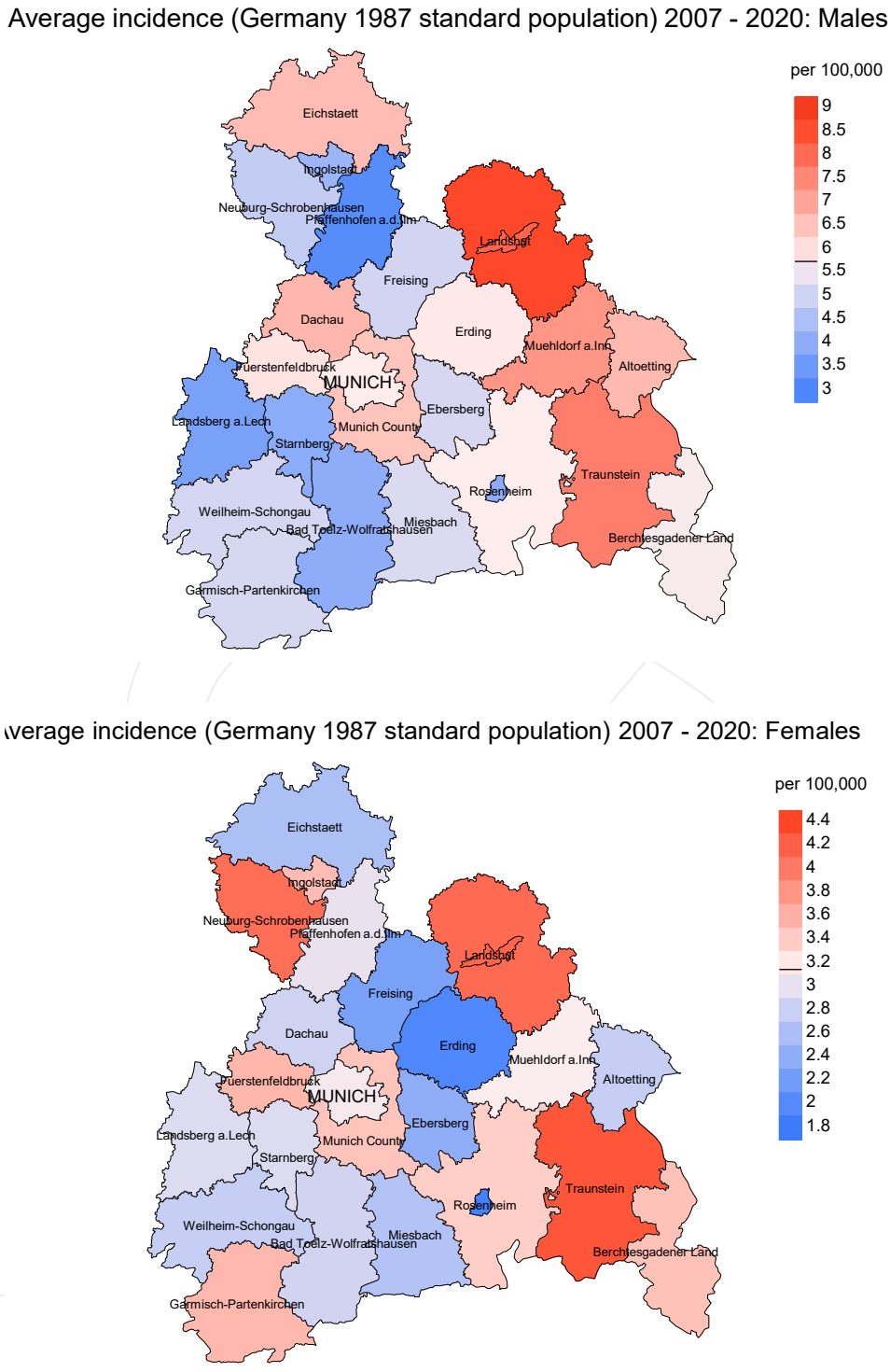


Figure 8a. Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 5.8/100,000 WS N=2,007, females 3.1/100,000 WS N=1,372).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,727 female residents (averaged) in the period from 2007 to 2020 a total of 30 women were identified with newly diagnosed lymphoid leukaemia. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 2.4/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 1.4 and 3.9/100,000.

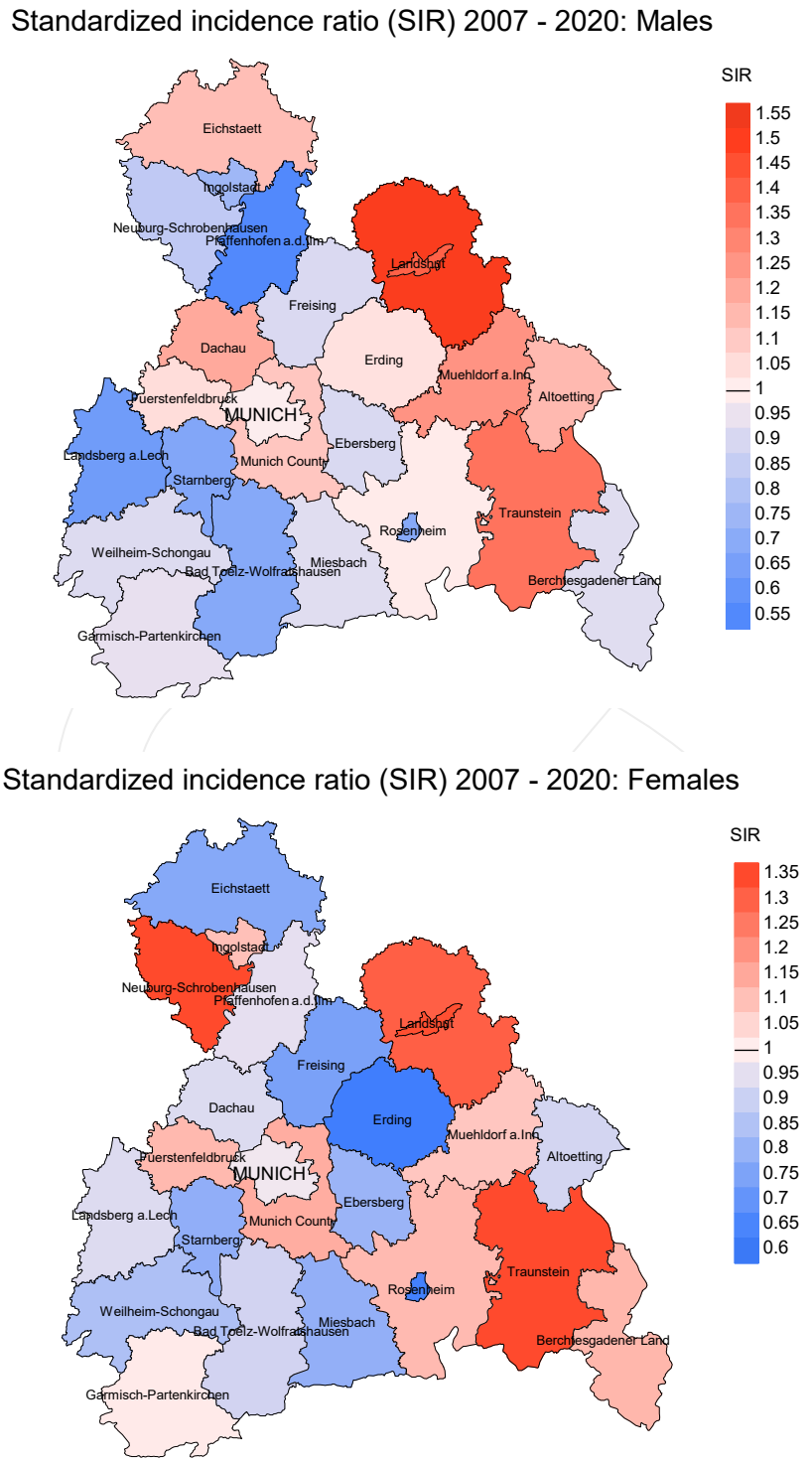


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=2,007, females N=1,372).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2020 a total of 30 women were identified with newly diagnosed lymphoid leukaemia. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.81. Though, the value of this parameter may vary with an underlying probability of 99% between 0.48 and 1.27, and is therefore not statistically striking.

MORTALITY

Table 9a

Annual cohorts: Incident cancers, follow-up status, proportion of DCO, deaths among the annual cohorts and proportion of available death certificates (with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.94 m as of 2007, respectively)

Year of diagnosis	Incident cases n	Prop. actively followed %	Prop. DCO %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	153	97.4	24.8	121	79.1	98.3
1999	137	97.8	13.9	95	69.3	95.8
2000	138	97.1	16.7	101	73.2	97.0
2001	183	96.2	25.1	139	76.0	96.4
2002	298	96.3	27.9	230	77.2	97.0
2003	268	96.6	26.1	195	72.8	96.9
2004	296	94.6	19.6	200	67.6	96.5
2005	290	94.5	22.4	202	69.7	96.5
2006	289	94.5	15.2	200	69.2	96.0
2007	339	94.4	18.3	220	64.9	96.4
2008	308	100.0	18.8	196	63.6	95.9
2009	322	97.5	16.5	191	59.3	95.8
2010	305	98.0	20.0	194	63.6	96.9
2011	310	98.7	18.7	178	57.4	95.5
2012	321	97.5	18.4	178	55.5	93.8
2013	297	96.6	18.9	174	58.6	92.5
2014	238	95.8	24.4	146	61.3	93.2
2015	234	97.0	22.6	128	54.7	96.1
2016	214	98.6	25.2	109	50.9	96.3
2017	214	97.7	34.1	112	52.3	93.8
2018	141	97.2	15.6	58	41.1	89.7
2019	75	97.3	4.0	23	30.7	73.9
2020	63	100.0		9	14.3	100.0
1998-2020	5433	96.8	20.5	3399	62.6	95.6

Table 9b

Annual cohorts of incident cancers and deaths, proportion of death certificates and cases deceased within the same year of being diagnosed with cancer (incl. DCO)
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.94 m as of 2007, respectively)

Year of diagnosis/ death	Incident cases n	Deaths n	Prop. deaths with death certific. %	Deaths in same year n	Prop. deaths in same year %
1998	153	86	98.8	38	24.8
1999	137	68	94.1	15	10.9
2000	138	73	94.5	24	17.4
2001	183	113	96.5	48	26.2
2002	298	153	98.7	92	30.9
2003	268	143	98.6	84	31.3
2004	296	140	99.3	61	20.6
2005	290	170	100.0	73	25.2
2006	289	161	98.1	60	20.8
2007	339	184	98.4	78	23.0
2008	308	185	98.9	65	21.1
2009	322	158	100.0	57	17.7
2010	305	184	99.5	77	25.2
2011	310	182	99.5	63	20.3
2012	321	203	99.0	69	21.5
2013	297	198	98.5	71	23.9
2014	238	199	99.0	65	27.3
2015	234	195	97.9	61	26.1
2016	214	202	99.0	66	30.8
2017	214	208	96.6	80	37.4
2018	141	169	75.1	35	24.8
2019	75	135	47.4	13	17.3
2020	63	145	94.5	5	7.9
1998–2020	5433	3654	95.4	1300	23.9

Table 9c

Annual cohorts of deaths, proportion of cancer-related and non-cancer-related deaths, and cancer recorded on death certificates (incl. DCO)
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.94 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer-related %	Prop. non-cancer-related %	Prop. cancer recorded on death certificate %
1998	86	57.0	43.0	95.3
1999	68	64.7	35.3	90.6
2000	73	63.0	37.0	98.6
2001	113	61.1	38.9	94.5
2002	153	77.8	22.2	96.0
2003	143	81.8	18.2	95.0
2004	140	85.7	14.3	95.0
2005	170	82.4	17.6	97.1
2006	161	78.9	21.1	93.0
2007	184	76.6	23.4	91.2
2008	185	82.7	17.3	90.7
2009	158	83.5	16.5	93.0
2010	184	79.3	20.7	94.0
2011	182	76.4	23.6	89.0
2012	203	78.8	21.2	90.0
2013	198	73.7	26.3	86.2
2014	199	69.3	30.7	85.8
2015	195	73.8	26.2	85.9
2016	202	69.3	30.7	88.0
2017	208	68.3	31.7	83.1
2018	169	65.7	34.3	63.8
2019	135	45.9	54.1	75.0
2020	145	58.6	41.4	60.6
1998-2020	3654	73.1	26.9	88.4

Table 10a

Medians of age at death according to the grouping in Table 9
MALES

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	48	73.1	67.7	83.0	73.1
1999	40	73.5	65.3	84.6	69.7
2000	48	72.1	71.0	76.6	72.1
2001	57	73.7	72.0	79.0	72.3
2002	87	75.6	75.5	76.4	77.1
2003	80	72.4	72.3	75.8	72.4
2004	87	73.3	73.0	79.8	73.3
2005	102	76.4	73.9	79.4	75.9
2006	98	74.3	73.0	82.4	73.7
2007	102	76.4	75.2	80.5	76.4
2008	113	75.5	74.6	80.9	75.3
2009	92	78.7	76.6	84.0	78.7
2010	112	77.5	76.9	79.6	77.6
2011	110	76.3	75.9	79.1	76.1
2012	124	77.5	76.9	81.4	77.6
2013	124	75.3	74.2	82.6	75.3
2014	124	78.8	76.3	83.6	77.8
2015	115	78.4	77.0	83.1	78.1
2016	127	80.1	79.6	80.7	80.0
2017	122	80.0	79.1	84.2	78.4
2018	121	76.9	74.5	81.4	72.8
2019	94	79.1	79.3	78.8	79.3
2020	87	78.9	77.1	81.7	77.9
1998–2020	2214	77.0	75.5	80.9	76.4

Deaths of patients are considered to be cancer-related, in case that fact was recorded on the death certificate, or patients had suffered from metastasis or recurrence.

Table 10b

Medians of age at death according to the grouping in Table 9
FEMALES

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	38	79.6	79.5	80.7	79.2
1999	28	80.2	76.5	84.6	78.3
2000	25	83.1	77.6	87.1	82.9
2001	56	78.3	76.4	81.0	77.8
2002	66	80.8	74.9	88.7	79.2
2003	63	79.1	77.5	85.2	78.6
2004	53	78.4	76.9	84.8	77.5
2005	68	80.2	78.0	89.3	79.8
2006	63	77.8	77.5	81.7	77.5
2007	82	81.1	77.5	86.9	81.1
2008	72	82.3	80.0	90.1	81.8
2009	66	79.5	77.3	83.5	79.5
2010	72	82.3	82.1	89.6	82.3
2011	72	80.9	76.9	84.3	79.4
2012	79	79.3	78.9	84.2	78.9
2013	74	82.1	81.7	86.9	82.2
2014	75	82.4	80.3	86.4	82.1
2015	80	78.5	76.5	86.1	76.7
2016	75	79.9	77.5	81.4	78.5
2017	86	83.2	79.9	85.6	81.6
2018	48	79.9	78.5	83.5	79.4
2019	41	81.4	78.6	85.2	84.6
2020	58	82.1	80.5	83.2	80.5
1998–2020	1440	80.5	78.3	85.2	79.5

By 2018, Bavarians' life expectancy at birth is estimated at 79.3 years for boys and 83.8 years for girls.

Deaths of patients are considered to be cancer-related, in case that fact was recorded on the death certificate, or patients had suffered from metastasis or recurrence.

Table 11a

Mortality measures (cancer-related death) and mortality-incidence-index
by year of death
MALES

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	31	2.8	0.35	2.0	0.34	2.7	0.35	3.3	0.36
1999	23	2.1	0.32	1.8	0.38	2.0	0.34	2.4	0.33
2000	33	2.9	0.39	2.2	0.39	2.8	0.40	3.4	0.43
2001	39	3.4	0.38	2.0	0.30	3.0	0.36	4.1	0.43
2002	71	3.8	0.41	2.1	0.32	3.2	0.39	4.6	0.47
2003	66	3.5	0.40	2.0	0.32	3.0	0.38	4.0	0.42
2004	75	4.0	0.42	2.2	0.32	3.3	0.39	4.4	0.45
2005	82	4.3	0.45	2.4	0.35	3.5	0.42	4.8	0.47
2006	77	4.0	0.42	2.0	0.30	3.1	0.37	4.2	0.43
2007	82	3.7	0.42	2.0	0.36	2.9	0.40	4.0	0.45
2008	93	4.2	0.51	2.0	0.34	3.1	0.45	4.3	0.53
2009	80	3.6	0.44	1.7	0.35	2.6	0.41	3.6	0.46
2010	88	3.9	0.49	1.6	0.31	2.6	0.41	3.9	0.50
2011	89	4.0	0.49	1.8	0.34	2.8	0.42	3.9	0.52
2012	93	4.1	0.50	1.9	0.33	2.8	0.43	4.0	0.50
2013	92	4.0	0.52	1.8	0.36	2.7	0.44	3.7	0.51
2014	87	3.7	0.57	1.5	0.41	2.4	0.48	3.4	0.57
2015	89	3.7	0.62	1.7	0.55	2.5	0.58	3.4	0.63
2016	92	3.8	0.72	1.4	0.52	2.3	0.60	3.4	0.70
2017	85	3.5	0.66	1.2	0.51	2.1	0.57	3.0	0.65
2018	76	3.1	0.94	1.5	0.88	2.2	0.92	2.8	0.92
2019	44	1.8	1.02	0.7	0.84	1.1	0.89	1.6	1.00
2020	53	2.2	1.08	0.9	0.81	1.3	0.93	1.9	1.06
1998-2020	1640	3.5	0.51	1.7	0.38	2.5	0.45	3.5	0.52

Table 11b

Mortality measures (cancer-related death) and mortality-incidence-index
by year of death
FEMALES

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	18	1.5	0.28	0.6	0.21	0.9	0.23	1.2	0.25
1999	21	1.8	0.32	0.8	0.18	1.1	0.23	1.4	0.29
2000	13	1.1	0.24	0.7	0.24	0.8	0.23	0.9	0.23
2001	30	2.5	0.38	0.9	0.23	1.5	0.30	2.0	0.37
2002	48	2.5	0.38	1.2	0.37	1.6	0.38	2.0	0.39
2003	51	2.6	0.50	1.1	0.34	1.6	0.42	2.1	0.50
2004	45	2.3	0.38	1.0	0.30	1.4	0.32	1.8	0.37
2005	58	2.9	0.53	1.0	0.30	1.6	0.41	2.2	0.47
2006	50	2.5	0.47	1.0	0.32	1.4	0.39	2.0	0.46
2007	59	2.6	0.41	1.0	0.25	1.5	0.31	1.9	0.37
2008	60	2.6	0.48	1.0	0.31	1.4	0.37	1.9	0.44
2009	52	2.2	0.37	1.0	0.29	1.4	0.33	1.8	0.38
2010	58	2.5	0.46	0.9	0.30	1.3	0.36	1.8	0.44
2011	50	2.1	0.38	0.9	0.27	1.2	0.32	1.6	0.37
2012	67	2.8	0.50	1.0	0.25	1.4	0.34	2.0	0.44
2013	54	2.3	0.45	0.8	0.28	1.2	0.34	1.6	0.40
2014	51	2.1	0.59	0.9	0.62	1.2	0.60	1.5	0.56
2015	55	2.3	0.60	0.9	0.51	1.2	0.53	1.7	0.60
2016	48	2.0	0.56	0.7	0.56	1.0	0.55	1.4	0.56
2017	57	2.3	0.67	0.6	0.55	1.0	0.57	1.5	0.62
2018	35	1.4	0.58	0.4	0.40	0.7	0.43	1.0	0.51
2019	18	0.7	0.56	0.2	0.34	0.4	0.41	0.5	0.46
2020	32	1.3	2.29	0.3	1.16	0.6	1.48	0.8	1.88
1998-2020	1030	2.1	0.47	0.8	0.32	1.2	0.38	1.6	0.44

Table 12

Age distribution of age at death (cancer-related) for period 2007-2020
(**incl. multiple malignancies**)

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	3	0.2	0.2			0.0	3	0.4	0.4
5-9	10	0.5	0.7	6	0.5	0.5	4	0.6	1.0
10-14	11	0.6	1.3	3	0.3	0.8	8	1.1	2.2
15-19	9	0.5	1.8	6	0.5	1.3	3	0.4	2.6
20-24	14	0.8	2.6	10	0.9	2.2	4	0.6	3.2
25-29	8	0.4	3.0	6	0.5	2.7	2	0.3	3.4
30-34	16	0.9	3.9	8	0.7	3.4	8	1.1	4.6
35-39	17	0.9	4.8	10	0.9	4.3	7	1.0	5.6
40-44	21	1.1	5.9	15	1.3	5.6	6	0.9	6.5
45-49	21	1.1	7.1	11	1.0	6.6	10	1.4	7.9
50-54	31	1.7	8.8	21	1.8	8.4	10	1.4	9.3
55-59	64	3.5	12.2	45	3.9	12.3	19	2.7	12.1
60-64	94	5.1	17.3	61	5.3	17.7	33	4.7	16.8
65-69	157	8.5	25.9	106	9.3	26.9	51	7.3	24.1
70-74	275	15.0	40.8	185	16.2	43.1	90	12.9	37.1
75-79	360	19.6	60.4	245	21.4	64.6	115	16.5	53.6
80-84	356	19.4	79.8	213	18.6	83.2	143	20.5	74.1
85+	372	20.2	100.0	192	16.8	100.0	180	25.9	100.0
All ages	1839	100.0		1143	100.0		696	100.0	

Table 13

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2020
(**incl. multiple malignancies**)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4		3			0.2	0.08		18.8
5- 9	6	4	0.4	0.19	0.3	0.13	21.4	16.0
10-14	3	8	0.2	0.14	0.5	0.47	10.7	34.8
15-19	6	3	0.3	0.23	0.2	0.20	12.5	12.0
20-24	10	4	0.5	0.59	0.2	0.40	13.7	9.3
25-29	6	2	0.3	0.43	0.1	0.15	6.5	2.0
30-34	8	8	0.3	0.42	0.4	0.47	5.6	4.4
35-39	10	7	0.4	0.40	0.3	0.44	3.7	1.7
40-44	15	6	0.6	0.42	0.2	0.17	2.5	0.7
45-49	11	10	0.4	0.14	0.4	0.36	0.8	0.6
50-54	21	10	0.8	0.20	0.4	0.23	0.8	0.4
55-59	45	19	2.1	0.34	0.9	0.25	1.0	0.5
60-64	61	33	3.5	0.40	1.7	0.32	1.0	0.7
65-69	106	51	6.5	0.42	2.8	0.36	1.2	0.7
70-74	185	90	12.3	0.60	5.2	0.51	1.6	1.0
75-79	245	115	20.2	0.84	7.7	0.69	2.0	1.2
80-84	213	143	29.4	0.89	13.4	0.86	2.0	1.5
85+	192	180	41.1	0.93	17.3	0.64	2.1	1.5
All ages	1143	696					1.6	1.1
Mortality								
Raw			3.5	0.57	2.1	0.51		
WS			1.5	0.41	0.8	0.34		
ES			2.3	0.50	1.1	0.40		
BRD-S			3.3	0.57	1.5	0.47		
PYLL-70								
per 100,000			15.8		10.8			
ES			15.5		11.6			
AYLL-70			14.7		18.2			

Table 14a

Further malignancies in deaths in period 1998–2020
MALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03–C06	Oral cavity	8	0.8	2	25.0	2	25.0	4	50.0
C07–C08	Salivary gland	6	0.6			2	33.3	4	66.7
C09–C10	Oropharynx	3	0.3	1	33.3			2	66.7
C12–C13	Hypopharynx	3	0.3			1	33.3	2	66.7
C15	Oesophagus	10	0.9	3	30.0	1	10.0	6	60.0
C16	Stomach	26	2.5	5	19.2	4	15.4	17	65.4
C17	Small intestine	3	0.3			1	33.3	2	66.7
C18	Colon	66	6.3	21	31.8	8	12.1	37	56.1
C19–C20	Rectum	40	3.8	14	35.0	6	15.0	20	50.0
C22	Liver	9	0.9			1	11.1	8	88.9
C23–C24	Bile	2	0.2	1	50.0			1	50.0
C25	Pancreas	16	1.5			4	25.0	12	75.0
C32	Larynx	8	0.8	6	75.0	1	12.5	1	12.5
C33–C34	Lung	96	9.1	11	11.5	21	21.9	64	66.7
C38,C45	Mesothelioma	3	0.3			1	33.3	2	66.7
C43	Malign. melanoma	53	5.0	20	37.7	4	7.5	29	54.7
C44	Skin others	299	28.4	47	15.7	18	6.0	234	78.3
C46,C49	Soft tissue	15	1.4	5	33.3	1	6.7	9	60.0
C50	Breast	3	0.3	1	33.3			2	66.7
C60	Penis	2	0.2					2	100.0
C61	Prostate	172	16.3	86	50.0	17	9.9	69	40.1
C62	Testis	6	0.6	4	66.7			2	33.3
C64	Kidney	25	2.4	11	44.0	1	4.0	13	52.0
C65	Renal pelvis	2	0.2					2	100.0
C66	Ureter	2	0.2			1	50.0	1	50.0
C67	Bladder	36	3.4	14	38.9	4	11.1	18	50.0
C69	Eye melanoma	2	0.2	1	50.0			1	50.0
C70–C72	CNS cancer	13	1.2	1	7.7	1	7.7	11	84.6
C73	Thyroid	2	0.2	1	50.0			1	50.0
C76–C79	CUP	12	1.1			2	16.7	10	83.3
C81	Hodgkin lymphoma	15	1.4	5	33.3	2	13.3	8	53.3
C82–C85	NHL	61	5.8	8	13.1	5	8.2	48	78.7
C90	Mult. myeloma	8	0.8	2	25.0	3	37.5	3	37.5
C91–C96	Leukaemia	22	2.1	1	4.5	4	18.2	17	77.3
Others, specified		5	0.5	2	40.0	2	40.0	1	20.0
All further malignancies		1054	100.0	273	25.9	118	11.2	663	62.9

Further malignancies with number of cases 1 are pooled in category “Others, specified”.

ICD-10 C44 (Other malignant neoplasms of skin) is not systematically recorded by MCR and therefore not considered for evaluation as a particular primary but at least as a further malignancy.

Table 14b

Further malignancies in deaths in period 1998-2020
FEMALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C00	Lip	1	0.2					1	100.0
C03-C06	Oral cavity	2	0.4					2	100.0
C07-C08	Salivary gland	2	0.4	1	50.0			1	50.0
C09-C10	Oropharynx	1	0.2					1	100.0
C12-C13	Hypopharynx	1	0.2	1	100.0				
C15	Oesophagus	1	0.2			1	100.0		
C16	Stomach	9	2.0	1	11.1	4	44.4	4	44.4
C17	Small intestine	1	0.2			1	100.0		
C18	Colon	31	7.0	13	41.9	4	12.9	14	45.2
C19-C20	Rectum	13	2.9	7	53.8	1	7.7	5	38.5
C21	Anus/canal	3	0.7	1	33.3			2	66.7
C22	Liver	4	0.9	1	25.0			3	75.0
C23-C24	Bile	4	0.9	1	25.0	1	25.0	2	50.0
C25	Pancreas	14	3.1	1	7.1			13	92.9
C30-C31	Sinuses	1	0.2	1	100.0				
C33-C34	Lung	30	6.7	2	6.7	4	13.3	24	80.0
C40-C41	Bone	1	0.2	1	100.0				
C43	Malign. melanoma	18	4.0	8	44.4			10	55.6
C44	Skin others	93	20.9	34	36.6	4	4.3	55	59.1
C46,C49	Soft tissue	3	0.7	1	33.3			2	66.7
C48	Peritoneal	2	0.4	1	50.0			1	50.0
C50	Breast	81	18.2	47	58.0	7	8.6	27	33.3
C51	Vulva	4	0.9	4	100.0				
C53	Cervix uteri	6	1.3	5	83.3			1	16.7
C54	Corpus uteri	13	2.9	7	53.8	1	7.7	5	38.5
C55,C57	Fem. genitals un	1	0.2					1	100.0
C56	Ovary	13	2.9	3	23.1	2	15.4	8	61.5
C64	Kidney	13	2.9	4	30.8	3	23.1	6	46.2
C65	Renal pelvis	1	0.2					1	100.0
C67	Bladder	4	0.9	3	75.0	1	25.0		
C68	Urethra	1	0.2			1	100.0		
C69	Eye lymphoma	3	0.7	1	33.3			2	66.7
C69	Eye melanoma	1	0.2	1	100.0				
C70-C72	CNS cancer	11	2.5	2	18.2	3	27.3	6	54.5
C73	Thyroid	7	1.6	4	57.1			3	42.9
C74-C80	Cancer others	1	0.2	1	100.0				
C76-C79	CUP	7	1.6	2	28.6	1	14.3	4	57.1
C81	Hodgkin lymphoma	2	0.4	2	100.0				
C82-C85	NHL	31	7.0	2	6.5	2	6.5	27	87.1
C90	Mult. myeloma	3	0.7			1	33.3	2	66.7
C91-C96	Leukaemia	8	1.8	1	12.5	2	25.0	5	62.5

Table 14b

Further malignancies in deaths in period 1998–2020
FEMALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
All further malignancies	446	100.0	164	36.8	44	9.9	238	53.4

ICD-10 C44 (Other malignant neoplasms of skin) is not systematically recorded by MCR and therefore not considered for evaluation as a particular primary but at least as a further malignancy.

Table 15

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2020
(**First primaries only** *)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	Males MI-index	Females Age-spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4		3			0.2	0.08		20.0
5- 9	6	4	0.4	0.19	0.3	0.14	22.2	16.0
10-14	3	8	0.2	0.14	0.5	0.47	10.7	42.1
15-19	6	2	0.3	0.23	0.1	0.14	13.0	8.7
20-24	10	4	0.5	0.59	0.2	0.40	15.2	9.8
25-29	5	2	0.2	0.38	0.1	0.15	5.9	2.2
30-34	8	8	0.3	0.42	0.4	0.47	5.8	5.0
35-39	10	7	0.4	0.40	0.3	0.47	4.0	1.9
40-44	13	5	0.5	0.39	0.2	0.16	2.3	0.7
45-49	9	9	0.3	0.12	0.3	0.38	0.7	0.6
50-54	17	8	0.7	0.18	0.3	0.23	0.7	0.4
55-59	42	14	2.0	0.36	0.6	0.24	1.1	0.4
60-64	43	26	2.4	0.38	1.4	0.33	0.8	0.6
65-69	77	37	4.7	0.41	2.0	0.36	1.0	0.7
70-74	149	72	9.9	0.71	4.2	0.55	1.6	1.1
75-79	190	84	15.7	1.02	5.6	0.78	2.1	1.1
80-84	155	112	21.4	0.99	10.5	0.96	2.1	1.5
85+	127	144	27.2	0.98	13.8	0.63	2.0	1.5
All ages	870	549					1.6	1.1
Mortality								
Raw			2.7	0.58	1.6	0.51		
WS			1.2	0.40	0.6	0.33		
ES			1.8	0.49	0.9	0.40		
BRD-S			2.5	0.58	1.2	0.47		
PYLL-70								
per 100,000			14.2		9.8			
ES			14.1		10.7			
AYLL-70			16.4		20.2			

* See corresponding tables with multiple malignancies.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2020
(**Single primaries only** *)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4		3			0.2	0.08		20.0
5- 9	6	4	0.4	0.19	0.3	0.14	22.2	16.0
10-14	3	7	0.2	0.14	0.5	0.44	10.7	36.8
15-19	6	2	0.3	0.24	0.1	0.14	13.0	9.1
20-24	8	4	0.4	0.47	0.2	0.40	12.1	10.0
25-29	3	2	0.1	0.23	0.1	0.15	3.5	2.3
30-34	8	8	0.3	0.44	0.4	0.47	5.8	5.1
35-39	8	7	0.3	0.35	0.3	0.47	3.2	1.9
40-44	10	5	0.4	0.30	0.2	0.17	1.8	0.7
45-49	7	7	0.3	0.10	0.3	0.33	0.5	0.5
50-54	15	6	0.6	0.18	0.2	0.21	0.6	0.3
55-59	30	12	1.4	0.29	0.6	0.24	0.8	0.4
60-64	21	17	1.2	0.22	0.9	0.27	0.4	0.4
65-69	46	27	2.8	0.34	1.5	0.34	0.6	0.5
70-74	90	51	6.0	0.65	3.0	0.48	1.0	0.8
75-79	106	53	8.8	0.72	3.5	0.62	1.2	0.7
80-84	95	84	13.1	0.74	7.9	0.79	1.4	1.2
85+	86	115	18.4	0.70	11.0	0.53	1.4	1.3
All ages	548	414					1.1	0.9
Mortality								
Raw			1.7	0.44	1.2	0.44		
WS			0.8	0.30	0.5	0.29		
ES			1.2	0.37	0.7	0.35		
BRD-S			1.6	0.43	0.9	0.41		
PYLL-70								
per 100,000			11.4		8.9			
ES			11.6		9.8			
AYLL-70			19.1		22.6			

* See corresponding tables with multiple malignancies.

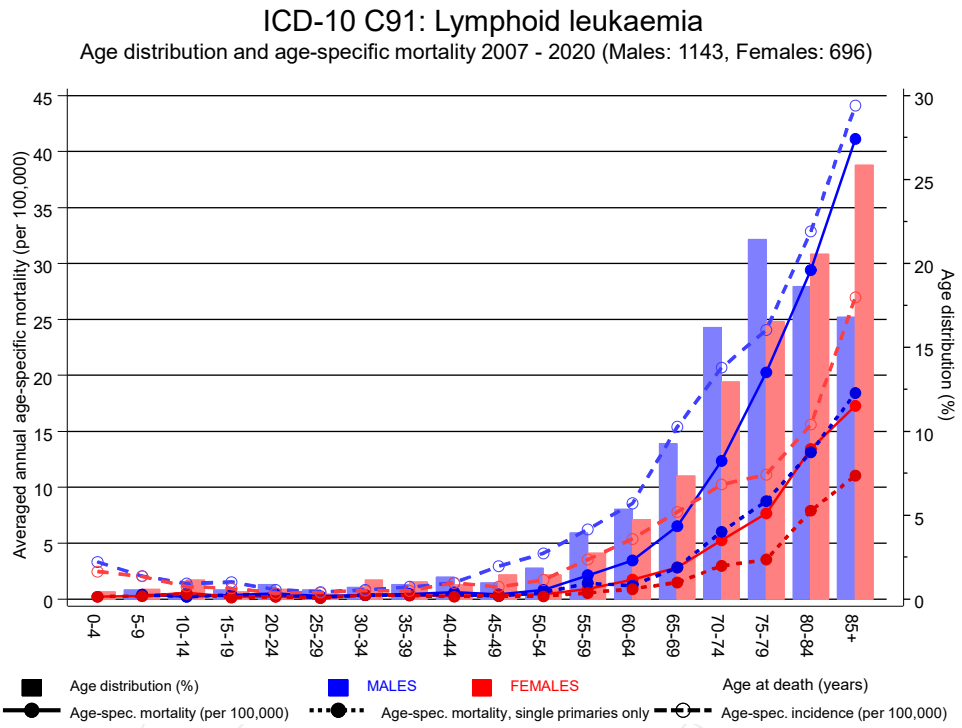


Figure 17. Distribution of age at death (bars; males: mean=66.8 yrs, median=69.1 yrs; females: mean=69.2 yrs, median=72.7 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

The difference between age at diagnosis (Table 3) and age at lymphoid leukaemia-related death (see Table 10) should be considered.

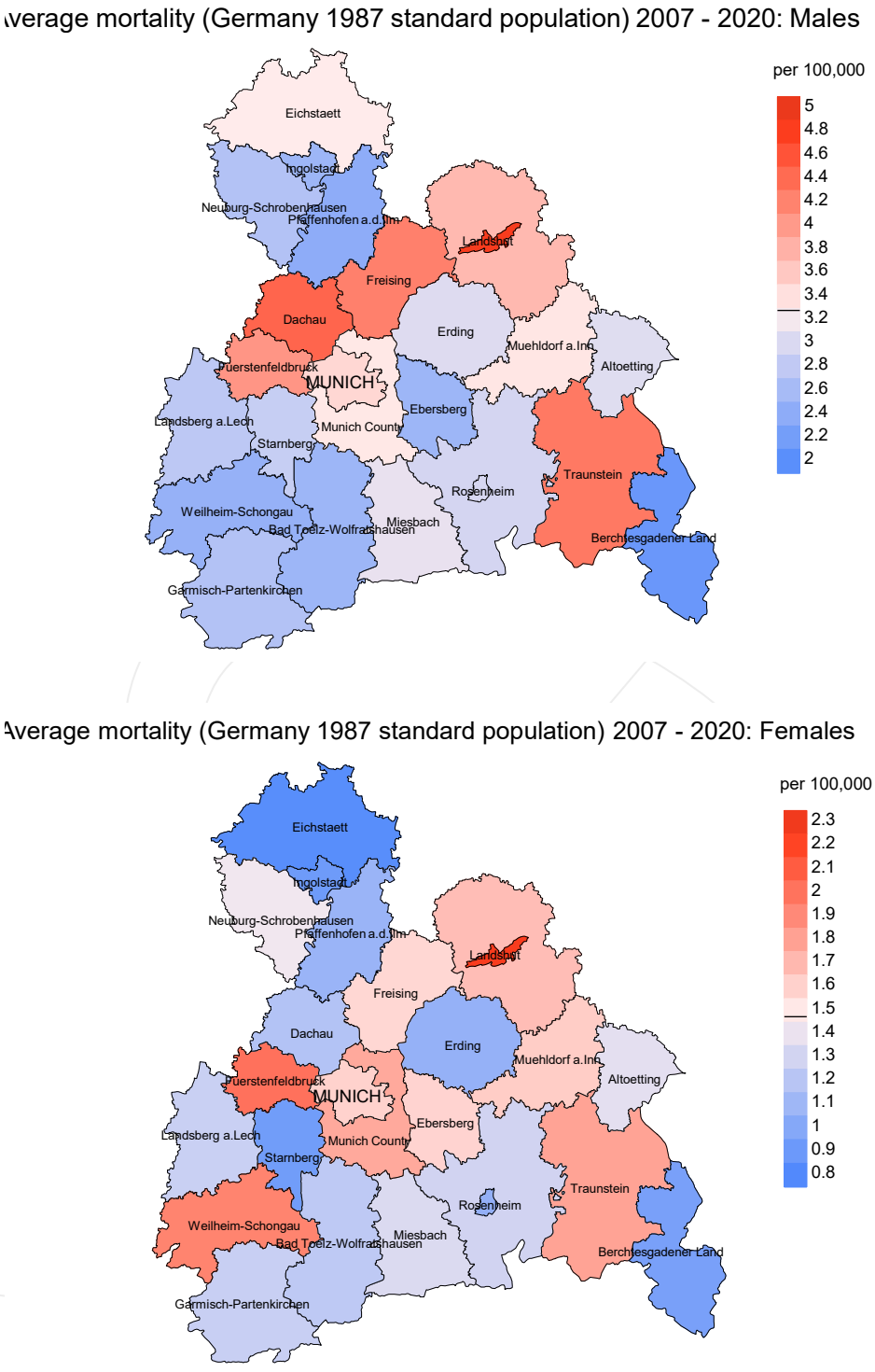
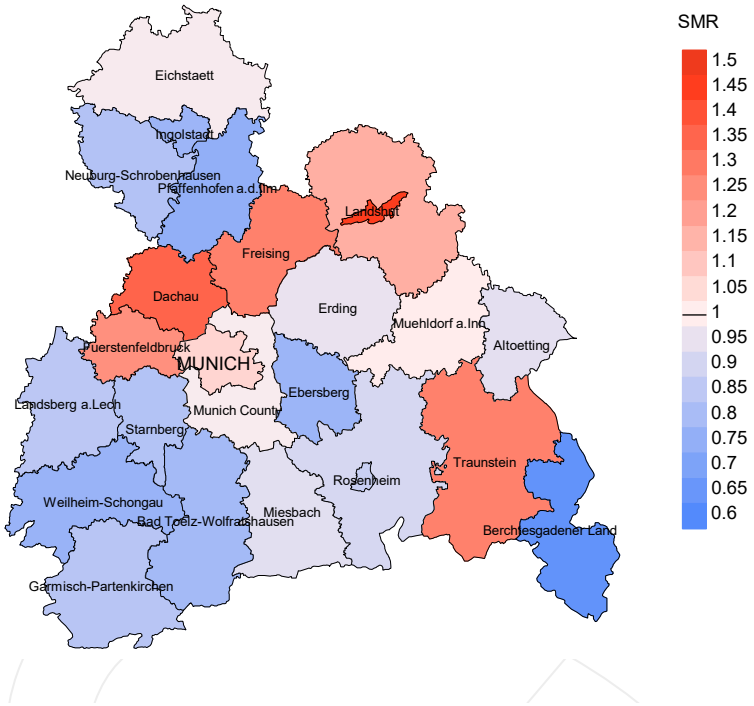


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2020. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 3.3/100,000 WS N=1,143, females 1.5/100,000 WS N=696).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,727 female residents (averaged) in the period from 2007 to 2020 a total of 21 women died from lymphoid leukaemia. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 1.6/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.8 and 2.8/100,000.

Standardized mortality ratio (SMR) 2007 - 2020: Males



Standardized mortality ratio (SMR) 2007 - 2020: Females

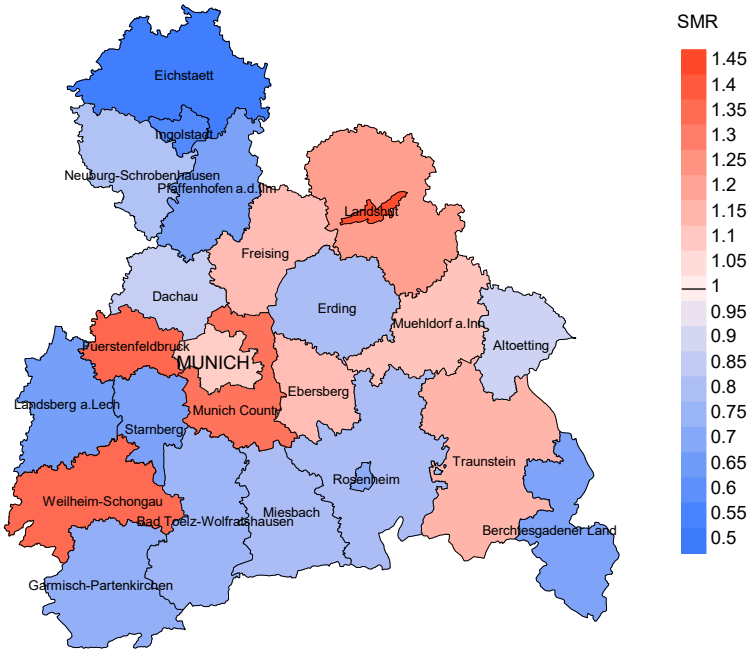


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=1,143, females N=696).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2020 a total of 21 women died from lymphoid leukaemia. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.13. Though, the value of this parameter may vary with an underlying probability of 99% between 0.60 and 1.94, and is therefore not statistically striking.

Statistical Notes

In all tables and figures the respective reference values should be carefully considered. The incidence rates include diagnoses (with multiple primary), and death certificate only (DCO) cases, where applicable. For mortality statistics patients, diagnoses and progressive course of disease are presented. In the calculations, all courses of disease are considered whereby progressions occurred and/or death certificate identified progressive cancers were ascertained. Additionally there are three groups of disease course to consider:

1. **All multiple primaries included**

   The mortality statistic describes the tumor-specific death, independent of any malignancy. The patient perspective, induced secondary malignancies, and the problem of multiple malignancies from the same primary tumor all have reasons for their inclusion.

2. **First singular primary** (no information about other prior or synchronous malignancy)

   The mortality statistic describes the cancer-related death for patients who have no therapeutic restrictions due to a previous or synchronous cancer. These statistics are comparable to studies that have exclusion criteria based on a second malignancy.

3. **Single primary** (no information about other prior, syn- or metachronous malignancy)

   The mortality statistic describes the tumor-specific death that occurs without any impact through secondary primaries, earlier, synchronous, later or induced. Precisely the difference between disease group 1 and 2 highlight the magnitude of the problem of secondary malignancies.

For this reason differences appear concerning official mono-causal mortality statistics. To judge the maximum deviation, 2 further tables are presented. In the first table the distribution of secondary malignancies before, at or after the described cancer are shown, that could be an alternative cause of death. In the second table, the age-specific mortality rates for all courses of disease, without designation of secondary malignancies are shown.

A previously minimally acknowledged statistic is the **age at death**, which allows for a good assessment of the quality of classification of the apparent tumor-specific death. For assumed tumor-independent deaths, the age of death should be estimated from the age of diagnosis and the normal life expectancy, whereas tumor-dependent deaths can be estimated from the age of diagnosis plus the average tumor-specific life expectancy. The comparison of different tumors demonstrates this association, if the causes of cancer and the competing cause of death are independent of each other (e.g. breast and colon versus head&neck and lung).

The ratio of mortality and incidence (mortality-to-incidence ratio, **MIR**, **MI-Index**) is a statistical index that allows for the evaluation of the quality of data. For diseases with poor prognoses, comparable values are obtained from all age groups, because to a large extent, the numerator and denominator contain the same cases. For tumors with a good prognosis, increasing and decreasing incidence and age-specific differences in prognosis can more strongly alter the MIR. Additionally, attention should be paid to the confidence intervals where fewer cases are reported.

The complexity of problems identified here emphasizes the importance of relative survival data for the appropriate analysis of long term results.

As a measurement of the burden of disease, the number of potential life years loss due to premature deaths in a cohort can be calculated (**PYLL**, potential years of life lost, standardized per 100,000 persons or per European standard) as well as the average loss of life years per individual (**AYLL**, average years of life lost). Depending upon the analytic aim (health economy, prevention, health care research) different methods exist for the generation of these measurements. In the results presented here, the age for a premature death is considered to be before 70 years, according to the guidelines of the OECD and the WHO (as seen in the abbreviation PYLL-70 or AYLL-70).

Shortcuts

MCR	Munich Cancer Registry (Tumorregister München)
GEKID	Association of Population-based Cancer Registries in Germany (Gesellschaft der epidemiologischen Krebsregister in Deutschland e.V.)
SEER	Surveillance, Epidemiology, and End Results (USA)
DCO	Death certificate only
BRD-S	German (FRG) standard population
ES	European standard population (old)
WS	World standard population
SIR	Standardized incidence ratio
CI	Confidence interval
EAR	Excess absolute risk = excess cancer cases (O - E) per 10,000 person-years
PYLL-70	Potential years of life lost prior to age 70 given a person dies before that age
AYLL-70	Average years of life lost prior to age 70 given a person dies before that age
SMR	Standardized mortality ratio
MI-index	Ratio of mortality to incidence, MIR
FRG	Federal Republic of Germany

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